

INTERVENTIONAL STUDY TO COMBAT OBESITY BY MEANS OF KINESIOLOGY

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Abstract: Obesity influences not only the reducing of daily life quality, but also the disease susceptibility and an increased mortality through endocrine diseases, cardiovascular, digestive, and so on. Subjects with BMI that is higher than 32, have a general mortality twice higher compared to subjects with normal weight. To determine the mechanisms of obesity, there have been made numerous researches and there have been developed several hypotheses, among these, more discussed, being found two theories. One of them, „exogenous” theory considers obesity as a reason to an external cause of human body, a simple consequence of an excessive food intake, a overeating; the second theory, „endogenous”, considers obesity as a reason to disorders of the body itself, an intake disorder or the use of food from nervous or endocrine causes.

Introduction:

Obesity is not a disease associated for a long time only with highly developed countries, this thing being proved by the alarming increase number of obesity detected worldwide, especially in countries less developed, that, a few years ago did not have this issue.

Over 1700 published studies there have been carefully examined, resulting from this research that this disease has occurred in the last 30 years.

Between 1980 and 2013, the number of overweight or obese persons has increased globally from 857 millions to 2.1 billions. More than 36% of men and 38% of women have now body mass index (BMI) higher than 25, the limit above which a person is considered to be overweight. In 2010, at global level, the overweight and obesity caused 3.4 millions of deaths, meaning about 3.9 lost years and 3.8 persons with a handicap due to this situation.

In Romania, approximate 30% of population suffers of obesity, 20% is overweight the number of overweight children is with 18% higher in the last 10 years, and the most affected are the persons with the age between 15-64 years.

In Romania there are over 3.5 millions of obese persons, only 10 % of these go to a medical examination, only 1% of them are included in a national program of education against obesity.

Material-method:

Study's hypothesis:

- 1) Weight loss can be achieved through means of kinesiology?
- 2) Can be improved psychological tone through exercises that are specific to kinesiology?
- 3) Can be increased the effort capacity of the obese person through exercises specific to kinesiology?
- 4) Can be developed mobility, balance, strength and resistance by practicing a kinesiology program?
- 5) Does therapy through movement help at forming a happier, more energetic and lively person?

The aim of this paper is that to verify the hypothesis and, based on study, to contribute at program's efficiency.

The study lasted 3 months, it started on the 1st January 2015 and it ended on 31st March 2015.

The main objective of this study is to ensure a change in the life of obese subject, through it follows that the body's energy expenditure to exceed the energy intake.

The objectives are to control food intake, weight loss, within this being analyzed, recorded and pursuing the anthropometric parameters; the increased effort capacity of the body; breathing improvement; muscle toning, especially the abdominal muscles; removal of associated diseases; improvement of physical and mental state of the person; prevent the weight re-growth.

The kinesiology program for the subject who suffers of obesity took place both at his residence, but also at the swimming pool from the Swimming and Kinesiology Complex Suceava.

The calculated parameters of the subject

Subject's weight: 120 kg

Height (stature or size): 1,76 cm

- *Body mass index (BMI)*

$BMI = m / h^2$; BMI=38,7

According to the obtained BMI, the subject suffers of obesity, degree II.

- *Broca Index*

$G=T-100$, where: G=weight in kilograms, T=height in centimeters;

$G=176-100$; $G=76$. According to the formula of Broca index, the normal weight for a subject with 176 cm height should be approximate 76 kg.

- *Pende method*

Ideal weight = height (cm) /2.4

Ideal weight = 176/2.4

According to the formula of Pende methods, the ideal weight for a subject with 176 cm height should be 73.3 kg.

Table 1 Weight parameters

	Initial testing	Final testing	Normal
BMI	38,7	36.6	între 18,5 și 24,9
Broca Index	120 kg	113	76 kg
Pende Method	120 kg	113	73,3 kg

Kinesiology program for combating obesity

There are some basic principles that need to be respected in order to elaborate any kinesiology program for overweight persons or obese persons, and these imply that exercises should be done in a slow and rhythmic way, without any sudden movements; exercises must be dispensed by means of progressive intensity, starting at low intensity through a growing one, avoiding fatigue; the last meal should be served with at least 2 hours before starting kinesiology meetings, not to overload the body; during the meetings the patient is asked to wear casual clothing, in clothes from natural tissues, allowing air to flow; final rule requires exercises to be done in stable positions, that have a large base of support, that allow their performing safe and obtaining maximum muscle efficiency.

There are performed 3 sessions of kinesiology at patient's home, in my presence and 2 sessions are done by the obese patient at his home. A session lasts approximate 45 minutes.

Initial and final examination of the subject

- ❖ Initial and final testing using the electronic scales for persons (Figure 1)



Figure 1 Initial and final body weight

- ❖ Testing joint mobility, according Hettinger System:
Testing number 1 - From orthostatic position, with knees in extension and feet together, it bends the trunk, the subject trying to touch the floor with hands.

Table 2 Mobility testing number 1, according to Hettinger System
(extract from book: „Kinesiology – an alternative in obesity control” by Tatiana Balint)

Touching the floor with hands	10 points
Touching the floor with fingers	8 points
Touching the floor with fingertips	6 points
Less than 2 cm distance between fingers and floor	5 points
At 3-5 cm distance between fingers and floor	4 points
At -10 cm distance between fingers and floor	3 points
At -15 cm distance between fingers and floor	2 points
Over 15 cm distance between fingers and floor	1 point

The subject gained 1 point, because the distance between the fingertips and floor was 26 cm.

Testing number 2 -Seated on the floor: it tries to bring the toe to the nose (it bends the trunk, the head, it pulls the leg with hands);

Table 3 Mobility testing number 2, according to Hettinger System
(extract from book: „Kinesiology – an alternative in obesity control” by Tatiana Balint)

If it touches the nose	5 points
Under 5 cm distance	4 points
5-10 cm distance	3 points
10-20 cm distance	2 points
Over 20 cm distance	1 point

The subject gained 1 point, because the distance between the nose and the toe of the left foot was 25 cm, and the distance between the nose and the toe of the right foot was 22 cm.

Table 4 Initial and final anthropometric measurements

Height	1,76 cm	1,76 cm
Perimeter of neckline	46,8	46,6 cm
Perimeter of thorax in inhale	124,3	122 cm
Perimeter of thorax in exhale	122,2	120 cm
Perimeter of the waist	124,5	119 cm
Perimeter of left arm	39,5	38 cm
Perimeter of right arm	41,2	40 cm
Perimeter of left forearm	32,2	31 cm
Perimeter of right forearm	32,8	32 cm
Perimeter of left thigh	65,6	64 cm
Perimeter of right thigh	65,6	64 cm
Perimeter of left shin	46,2	45 cm
Perimeter of the right shin	46,2	45 cm
Perimeter of left ankle	26,0	26 cm
Perimeter of right ankle	26,0	26 cm

Table 5 Initial and final testing of the functional parameters of the cardiac activity

Blood pressure in rest	129/90 mm Hg	113/89 mm Hg
Blood pressure during effort	140/90 mm Hg	133/87 mm Hg
Heart rate in rest (pulse)	92 beats/minute	85 beats/minute
Heart rate during effort (pulse)	100beats/minute	94 beats/minute

Conducting the kinesiology program

The kinesiology session starts with an introductory part, that consists of exercises for general heating of the musculoskeletal, followed by a

fundamental part where the chosen exercises are specific to the obesity treatment and a last part, the closing one, where effort progressively decreases, leaving time and space for breathing and relaxation exercises.

Each kinesiology session starts with analytical exercises, for selective influencing of the musculoskeletal which lasts 10-15 minutes.

In addition to analytical exercises and those specific to obesity treatment, there are included in all stages of this program, breathing exercises, because they have a very important role in patient's recovery and they are indispensable to the kinesiology program.

These breathing exercises strengthen the muscles that are used in breathing, increase the amount of inspired oxygen and they realize a much easier breathing. It is recommended that breathing exercises should be done about 5-10 minutes, 3-4 times a day.

Final examination of subject

- ❖ Body mass index (BMI)

$$\text{BMI} = m / h^2 ; \text{BMI} = 36,6$$

- ❖ Final evaluation of joint mobility, according to Hettinger System:

Testing number 1 of mobility - From the initial orthostatic position, with the knees in extension and close foot, it was made the trunk's flexion, the subject trying to touch the floor with his hands. In the final evaluation, the distance between the fingertips and floor was 20 cm, showing a mobility improvement with approximate 6 cm compared to the initial testing.

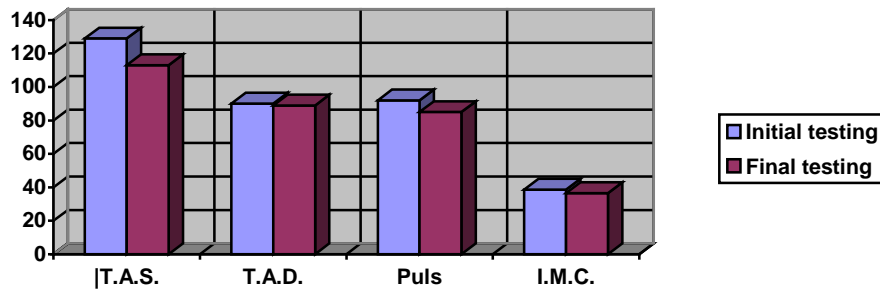
Testing number 2 of mobility - From the initial position, seated on the floor: it tries to bring the toe to the nose (it bends the trunk, the head it pulls the leg with hands).

The subject gained 2 points, because the distance between the nose and the toe of the left foot was 19 cm, and the distance between the nose and the toe of the right foot was 16 cm.

It has been found, therefore according to this test, an improvement of mobility, reducing the distance between the nose and the foot's toe, compared to the initial testing, with approximate 6 cm.

Results and discussions:

Presentation and graphic interpretation of research's data

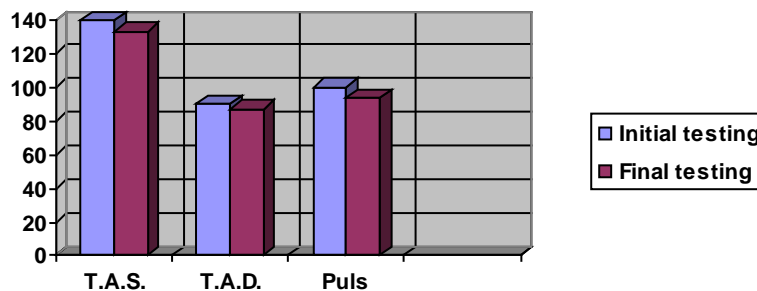


Graph 1- Initial and final testing, in rest, of systolic blood pressure

In graph 1 there can be seen that the values of systolic blood pressure (T.A.S) in rest from the initial testing is 129 mm Hg, and systolic blood pressure in rest, from the final testing is 113 mm Hg. In graph 1 there can be seen the diastolic blood pressure (T.A.D) in the initial and final testing, in rest. The diastolic blood pressure in rest, from initial testing is 90 mm Hg, and diastolic blood pressure in rest from the final testing is 89 mm Hg.

In graph 1 there can be seen pulse' values in rest, from the initial and final testing. In the initial testing, the pulse in rest had the value 92 beats/minute and in the final testing the pulse in rest had the value 85 beats/minute.

In graph 1 it is presented the value of BMI within the initial and final testing. In the initial testing the BMI had the value of 38.7 and within the final testing the BMI has the value of 36.6.



Graph 2 – Initial and final testing, during effort, of the systolic blood pressure

In graph 2 there are presented the values of systolic blood pressure, during effort, within the initial and final testing. In the initial testing, the systolic blood pressure during effort had the value of 140 mm Hg, and in the final testing, the systolic blood pressure during effort had the value of 133 mm Hg.

In graph 2 there are presented the values of diastolic blood pressure, during effort, in the initial and final testing. Within the initial testing, the diastolic blood pressure, during effort had the value of 90 mm Hg, and in the final testing the diastolic blood pressure, during effort had the value of 87 mm Hg.

In graph 2 there can be seen the pulse' values during effort, in the initial and final testing. Within the initial testing, pulse' value during effort was 100 beats/minute, and within the final testing, pulse' value during effort was 94 beats/minute.

Conclusions:

As a result of the study, the hypotheses were verified.

By using kinesiology, but also through compliance with a healthy diet, the obese subject managed to lose weight approximate 6.6 kg.

After he managed to lose weight, the life quality of the subject was visible improved; he feels much better, he moves easier, every day activities are much improved, being able to take part at activities with his children.

As a result of the kinesiology program, the subject balanced his psychological tone, he feels cheery, more energetic and more lively than he felt before losing weight.

The subject wants to continue the program in order to enhance and maintain the obtained results.

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STUDIU INTERVENȚIONAL DE COMBATERE A OBEZITĂȚII PRIN INTERMEDIUL MIJLOACELOR KINETOTERAPIEI

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Cuvinte cheie: obezitate, kinetoterapie, studiu intervențional

Rezumat:Obezitatea influențează nu doar reducerea calității vieții de zi cu zi și predispoziția de îmbolnăvire și o mortalitate crescută prin boli endocrine, cardiovasculare, digestive, etc.

Subiecții cu IMC mai mare de 32 au o mortalitate generală de 2 ori mai mare comparativ cu normoponderalii. Pentru determinarea mecanismelor de producere a obezității au fost efectuate numeroase cercetări și s-au elaborat mai multe ipoteze, dintre acestea, mai discutate regăsindu-se două teorii. Una dintre ele, teoria „exogenă”, consideră obezitatea ca fiind datorată unei cauze exterioare organismului, o simplă consecință a unui aport alimentar excesiv, o supraalimentație; a doua teorie, „endogenă”, consideră obezitatea ca datorită unei tulburări a organismului însuși, unei tulburări de aport sau de utilizare a alimentelor din cauze nervoase sau endocrine.